

WHAT IS CLAIMED IS:

1. A fuel injection amount control apparatus of an internal combustion engine, which is arranged to start injection of a fuel when a certain engine start condition is satisfied, and stop the injection of the fuel when a certain engine stop condition is satisfied, comprising:

a fuel injecting unit that injects the fuel in an intake passage that is connected to a combustion chamber of the engine;

a fuel deposition amount estimating unit that estimates a fuel deposition amount that is an amount of fuel deposited on an intake passage forming member that defines the intake passage;

a fuel injection amount determining unit that determines a fuel injection amount that is an amount of fuel injected from the fuel injecting unit, based on the estimated fuel deposition amount; and

a particular process executing unit that executes a particular process for making an actual fuel deposition amount on the intake passage forming member substantially equal to zero, after the engine stop condition is satisfied and before the injection of the fuel is started under a condition that the engine start condition is satisfied.

2. The fuel injection amount control apparatus according to claim 1, further comprising a pre-start injection commanding unit that causes the fuel injecting unit to inject a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process executed by the particular process executing unit.

3. The fuel injection amount control apparatus according to claim 1, further comprising:

a motoring unit capable of executing motoring of the internal combustion

engine, wherein

the particular process executing unit causes the motoring unit to execute motoring of the engine as the particular process.

4. The fuel injection amount control apparatus according to claim 3, wherein:

the internal combustion engine includes an introduction passage through which a part of an exhaust gas that passes an exhaust passage of the engine is introduced into the intake passage; and

the particular process executing unit introduces the part of the exhaust gas into the intake passage through the introduction passage when the motoring unit executes motoring of the engine.

5. The fuel injection amount control apparatus according to claim 4, further comprising a pre-start injection commanding unit that causes the fuel injecting unit to inject a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process executed by the particular process executing unit.

6. The fuel injection amount control apparatus according to claim 3, further comprising a pre-start injection commanding unit that causes the fuel injecting unit to inject a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process executed by the particular process executing unit.

7. The fuel injection amount control apparatus according to claim 3, wherein the particular process executing unit causes the motoring unit to execute

motoring of the engine immediately after the engine stop condition is satisfied.

8. The fuel injection amount control apparatus according to claim 7, wherein:

the internal combustion engine includes an introduction passage through which a part of an exhaust gas that passes an exhaust passage of the engine is introduced into the intake passage; and

the particular process executing unit introduces the part of the exhaust gas into the intake passage through the introduction passage when the motoring unit executes motoring of the engine.

9. The fuel injection amount control apparatus according to claim 8, further comprising a pre-start injection commanding unit that causes the fuel injecting unit to inject a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process executed by the particular process executing unit.

10. The fuel injection amount control apparatus according to claim 7, further comprising a pre-start injection commanding unit that causes the fuel injecting unit to inject a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process executed by the particular process executing unit.

11. A method of controlling a fuel injection amount of an internal combustion engine, in which injection of a fuel is started when a certain engine start condition is satisfied, and is stopped when a certain engine stop condition is satisfied, comprising the steps of:

injecting the fuel in an intake passage that is connected to a combustion chamber of the engine;

estimating a fuel deposition amount that is an amount of fuel deposited on an intake passage forming member that defines the intake passage;

determining a fuel injection amount that is an amount of fuel injected in the intake passage, based on the estimated fuel deposition amount; and

executing a particular process for making an actual fuel deposition amount on the intake passage forming member substantially equal to zero, after the engine stop condition is satisfied and before the injection of the fuel is started under a condition that the engine start condition is satisfied.

12. The method according to claim 11, further comprising the step of injecting a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process.

13. The method according to claim 11, further comprising the step of executing motoring of the internal combustion engine as the particular process.

14. The method according to claim 13, wherein:

the internal combustion engine includes an introduction passage through which a part of an exhaust gas that passes an exhaust passage of the engine is introduced into the intake passage; and

the part of the exhaust gas is introduced into the intake passage through the introduction passage when motoring of the engine is executed as the particular process.

15. The method according to claim 14, further comprising the step of injecting a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel

deposition amount on the intake passage forming member is made substantially equal to zero through the particular process.

16. The method according to claim 13, further comprising the step of injecting a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process.

17. The method according to claim 13, wherein motoring of the engine is executed as the particular process immediately after the engine stop condition is satisfied.

18. The method according to claim 17, wherein:
the internal combustion engine includes an introduction passage through which a part of an exhaust gas that passes an exhaust passage of the engine is introduced into the intake passage; and
the part of the exhaust gas is introduced into the intake passage through the introduction passage when motoring of the engine is executed as the particular process.

19. The method according to claim 18, further comprising the step of injecting a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially equal to zero through the particular process.

20. The method according to claim 17, further comprising the step of injecting a predetermined amount of fuel prior to a start of the injection of the fuel under the condition that the engine start condition is satisfied, after the actual fuel deposition amount on the intake passage forming member is made substantially

equal to zero through the particular process.